

CLAIMS:

Sub B4
1. Transmission system comprising a transmitter with an encoder for encoding an audio signal, the encoder comprises frequency determining means for determining a frequency of at least one periodical component of the audio signal, the transmitter further comprises transmitting means for transmitting a signal representing said frequency to a receiver, said receiver comprises receiving means for receiving a signal representing said frequency from the transmitter, and a decoder for deriving a reconstructed audio signal on the basis of said frequency, characterized in that the encoder further comprises frequency change determining means for determining a frequency change of said at least one periodical component of the audio signal over a predetermined amount of time.

2. Transmission system according to claim 1, characterized in that the transmitting means are arranged for transmitting a further signal representing said frequency change to the receiver, in that the receiver is arranged for receiving said further signal, and in that the decoder is arranged for deriving said reconstructed audio signal also on basis of said frequency change.

3. A Transmission system according to claim 1 or 2, characterized in that the encoder comprises means for determining a fundamental frequency from the audio signal using said frequency change.

4. A Transmission system according to ^{claim 1} ~~one of the claims 1, 2, or 3~~, characterized in that the encoder comprises time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal.

5. A Transmission system according to claim 1, 2, 3 or 4, characterized in that the frequency change determining means comprise time transform determining means for deriving

a plurality of time transformed audio signals, each corresponding to a different time transform, and in that the time transform determining means comprise selection means for selecting the time transform corresponding to the time transformed audio signal having a smallest frequency change over said predetermined amount of time.

6. Transmission system according to claim 5, characterized in that the time transform determining means are arranged for selecting the time transformed audio signal having the smallest frequency change over said predetermined amount of time by selecting the time transformed audio signal having the highest peak in its autocorrelation function.

7. ^{claim 4} Transmission system according to ~~one of the claims 4 to 6~~, characterized in that the time transform is defined by a quadratic relation between the actual time and the transformed time.

8. Transmission system according to claim 7, characterized in that the relation between the actual time t and the transformed time τ is defined by

$$\tau(t) = \frac{a}{T} \cdot t^2 + (1-a) \cdot t \quad ; \quad 0 \leq t \leq T$$
 in which a is a parameter defining the time transform and T is the duration of a signal segment.

9. Transmitter with an encoder for encoding an audio signal, the encoder comprises frequency determining means for determining a frequency of at least one periodical component of the audio signal, the transmitter further comprises transmitting means for transmitting a signal representing said frequency, characterized in that the encoder further comprises frequency change determining means for determining a frequency change of said at least one periodical component of the audio signal over a predetermined amount of time.

10. Transmitter according to claim 9, characterized in that the transmitting means are arranged for transmitting a further signal representing said frequency change.

11. ^A Transmitter according to claim 9 ~~or 10~~, characterized in that the encoder comprises means for determining a fundamental frequency from the audio signal under use of said change of said fundamental frequency over a predetermined amount of time.

12. Transmitter according to ~~one of the claims 9, 10, or 11~~, characterized in that the encoder comprises time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal.

13. Receiver comprising receiving means for receiving an encoded audio signal representing an audio signal by at least a frequency of at least one periodical component of the audio signal, and a decoder for deriving a reconstructed audio signal on the basis of said frequency, characterized in that the receiver is arranged for receiving a further signal representing a frequency change of said at least one periodical component of said audio signal over a predetermined amount of time, and in that the decoder is arranged for deriving said reconstructed audio signal also on the basis of said frequency change.

14. Receiver according to claim 13, characterized in that the decoder comprises time transforming means for obtaining the reconstructed audio signal by time transforming a decoded signal wherein the time transforming means are arranged for time expanding the decoded signal during a first part of the predetermined amount of time and for time compressing the decoded signal during a second part of the predetermined amount of time in such a way that the time transformed decoded signal has a larger frequency change than the decoded signal.

15. Encoder for encoding an audio signal, the encoder comprises means for determining a frequency of at least one periodical component of the audio signal, and for deriving a signal representing said frequency, characterized in that the encoder further comprises frequency change determining means for determining a signal representing a frequency change of said at least one periodical component over a predetermined amount of time.

16. Encoder according to claim 15, characterized in that the encoder comprises time transforming means for obtaining a time transformed audio signal, wherein the time transforming means are arranged for time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second

part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal.

17. Decoder for deriving a reconstructed audio signal from an encoded audio signal representing said audio signal by at least a frequency of at least one periodical component of the audio signal, and a decoder for deriving a reconstructed audio signal on the basis of said frequency, characterized in that the decoder is arranged for deriving said reconstructed audio signal also on the basis of a further signal representing a frequency change of said at least one periodical component over a predetermined amount of time.

18. Decoder according to claim 17, characterized in that the decoder comprises time transforming means for obtaining the reconstructed audio signal by time transforming a decoded signal wherein the time transforming means are arranged for time expanding the decoded signal during a first part of the predetermined amount of time and for time compressing the decoded signal during a second part of the predetermined amount of time in such a way that the reconstructed audio signal has a larger frequency change than the decoded signal.

19. Method for encoding an audio signal comprising determining a frequency of at least one periodical component, and deriving a signal representing said frequency of at least one periodical component of the audio signal, characterized in that the method further comprises determining a signal representing a frequency change of said at least one periodical component of the audio signal over a predetermined amount of time.

20. Method according to claim 19, characterized in that the method comprises deriving a time transformed audio signal, the method further comprising time compressing the audio signal during a first part of the predetermined amount of time and for time expanding the audio signal during a second part of the predetermined amount of time in such a way that the time transformed audio signal has a smaller frequency change than the audio signal.

21. Method for deriving a reconstructed audio signal from an encoded audio signal representing said audio signal by at least a frequency of at least one periodical component of the audio signal, and a decoder for deriving a reconstructed audio signal on basis of said frequency, characterized in that the method comprises deriving said reconstructed audio signal

also on basis of a further signal representing a frequency change of said at least one periodical component of the audio signal over a predetermined amount of time.

22. Method according to claim 21, characterized in that the method comprises deriving the reconstructed audio signal by a time transforming of a decoded signal wherein the time transforming comprises time expanding the decoded signal during a first part of the predetermined amount of time and for time compressing the decoded signal during a second part of the predetermined amount of time in such a way that the time transformed decoded signal has a larger frequency change than the decoded signal.

23. Storage medium carrying a computer program for performing a method according to ^{claim 19} ~~one of the claims 19 to 22.~~

24. Signal carrying a computer program for performing a method according to ^{claim 19} ~~one of the claims 19 to 22.~~

25. Encoded audio signal representing said audio signal by at least a frequency of at least one periodical component of the audio signal, characterized in that the encoded audio signal comprises a further signal component representing a frequency change of said at least one periodical component over a predetermined amount of time.

26. Storage medium carrying an encoded audio signal according to claim 23.